

WHAT IS CLAIMED IS:

1. A photo-semiconductor module comprising:  
a circuit board;

5 a light-receiving photo-semiconductor device mounted  
on said circuit board in a flip-chip manner; and  
an optical fiber fixed to a mounting face of said  
light-receiving photo-semiconductor device or a back face of  
said mounting face.

10 2. The photo-semiconductor module according to claim  
1, wherein said light-receiving photo-semiconductor device has  
a photo-absorbing layer, so that said optical fiber is fixed  
at a position opposite to said photo-absorbing layer along a  
15 direction perpendicular to said mounting face.

20 3. The photo-semiconductor module according to claim  
1, wherein said circuit board has a connection electrode, so  
that an input/output terminal electrode of said light-  
receiving photo-semiconductor device provided on said mounting  
face is connected to said connection electrode via a protruding  
electrode and a conductive adhesive agent.

25 4. The photo-semiconductor module according to claim  
3, wherein surroundings of a connection between said  
input/output terminal electrode and said connection electrode  
are encapsulated by an encapsulating resin.

30 5. The photo-semiconductor module according to claim  
4, wherein an opposing portion between said light-receiving  
photo-semiconductor device and said circuit board except said  
connection is encapsulated by said encapsulating resin.

6. The photo-semiconductor module according to claim 1, wherein said circuit board has a connection electrode, so that an input/output terminal electrode of said light-receiving photo-semiconductor device provided on said mounting  
5 face is connected to said connection electrode via solder.

7. The photo-semiconductor module according to claim 6, wherein surroundings of a connection between said input/output terminal electrode and said connection electrode are encapsulated by an encapsulating resin.

8. The photo-semiconductor module according to claim 7, wherein an opposing portion between said light-receiving photo-semiconductor device and said circuit board except said  
15 connection is encapsulated by said encapsulating resin.

9. The photo-semiconductor module according to claim 1, wherein said optical fiber is fixed to said back face using an adhesive resin.

10. The photo-semiconductor module according to claim 9, wherein said back face is provided with a mounting hole formed therein toward said mounting face, in which mounting hole is inserted and fixed said optical fiber.

11. The photo-semiconductor module according to claim 10, wherein said mounting hole has such a depth that extends to a vicinity of a photo-absorbing layer of said light-receiving photo-semiconductor device.

12. The photo-semiconductor module according to claim 1, wherein said light-receiving photo-semiconductor device is

provided on a compound semiconductor substrate having a Pin-photodiode.

13. The photo-semiconductor module according to claim 5 12, wherein said circuit board has a connection electrode, so that said connection electrode to be connected at least to either one of P-side and N-side electrodes of said Pin-photodiode is provided at such a site of said circuit board that is opposite to a periphery of said light-receiving photo-semiconductor device.

14. The photo-semiconductor module according to claim 9, further comprising an auxiliary mounting plate having a through-hole therein, so that said optical fiber is fixed to said light-receiving photo-semiconductor device by fixing said auxiliary mounting plate to said back face with said optical fiber as inserted and fixed in said through-hole.

15 15. The photo-semiconductor module according to claim 20 14, comprising an encapsulating resin which encapsulates surroundings of a connection between said input/output terminal electrode and said connection electrode, so that said encapsulating resin is used to fix said auxiliary mounting plate to said back face.

25 16. A method for manufacturing a photo-semiconductor module having a circuit board, a light-receiving photo-semiconductor device mounted flip-chip-wise on said circuit board, and an optical fiber fixed to a back face of a mounting face of said light-receiving photo-semiconductor device, comprising the steps of:

forming a protruding electrode to an input/output terminal electrode provided on said mounting face to then

supply a conductive adhesive agent to said protruding electrode;

installing said light-receiving photo-semiconductor device to said circuit board so that said input/output terminal electrode may butt against a connection electrode provided on said circuit board;

hardening said conductive adhesive agent to thereby mount said light-receiving photo-semiconductor device to said circuit board;

encapsulating a connection site between said light-receiving photo-semiconductor device and said circuit board, using an encapsulating resin; and

fixing an optical fiber to said back face.

17. The method for mounting a photo-semiconductor module according to claim 16, wherein:

a photo-hardening resin is used as an adhesive agent to fix said optical fiber and said encapsulating resin; and said encapsulating resin and said adhesive agent are photo-hardened simultaneously.

18. The method for manufacturing a photo-semiconductor module according to claim 16, wherein:

a compound semiconductor substrate having a Pin-photodiode is used to make said light-receiving photo-semiconductor device; and

said protruding electrode is formed on said input/output terminal electrode with both short-side faces of said compound semiconductor substrate as sandwiched by a jig.

19. A method for manufacturing a photo-semiconductor module having a circuit board, a light-receiving photo-semiconductor device mounted flip-chip-wise on said circuit

board, and an optical fiber fixed to a back face of a mounting face of said light-receiving photo-semiconductor device, comprising the steps of:

supplying solder to a connection electrode provided on said circuit board;

installing said light-receiving photo-semiconductor device to said circuit board so that said input/output terminal electrode may butt against said connection electrode provided on said mounting face;

melting said solder to thereby mount said light-receiving photo-semiconductor device to said circuit board;

encapsulating a connection site between said light-receiving photo-semiconductor device and said circuit board, using an encapsulating resin; and

fixing an optical fiber to said back face.

20. The method for mounting a photo-semiconductor module according to claim 19, wherein:

a photo-hardening resin is used as an adhesive agent to fix said optical fiber and said encapsulating resin; and said encapsulating resin and said adhesive agent are photo-hardened simultaneously.

21. The method for manufacturing a photo-semiconductor module according to claim 19, wherein heat and load are applied to said solder to thereby produce a diffused compound between said solder and said terminal electrode.